

**From:** [Granger, Michelle](#)  
**To:** [Hauber, Erin M CIV USARMY CENWK \(US\)](#)  
**Subject:** RE: Pohatcong OU3 - SVE well construction question  
**Date:** Wednesday, May 30, 2018 8:20:00 AM

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Hi, Erin-

Thank you for telling me about my VM. That is so strange! I will change it. I have no idea how that happened?!

Anyway, thank you for your email. I will discuss your concerns and questions below with Kim. We'll probably want to have a call. What is your availability for today and tomorrow?

Best,

Michelle-

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**From:** Hauber, Erin M CIV USARMY CENWK (US) [mailto:Erin.M.Hauber@usace.army.mil]  
**Sent:** Tuesday, May 29, 2018 4:36 PM  
**To:** Granger, Michelle <Granger.Michelle@epa.gov>  
**Cc:** Oconnell, Kimberly <OConnell.Kim@epa.gov>; L'Ecuyer, Jason R CIV USARMY CENWK (US) <Jason.R.LEcuyer@usace.army.mil>; Watts, Joshua A CIV USARMY CENWK (US) <Joshua.A.Watts@usace.army.mil>  
**Subject:** Pohatcong OU3 - SVE well construction question

Hi Michelle,

I was reviewing the SVE pilot study details with Jason L'Ecuyer who will be onsite to observe the SVE test and recalled that our SVE work plan assumed the following three test intervals: 20-30 ft, 60-70 ft, and 100-110-ft bgs. I also remembered that these depth intervals would be revisited based on the PDI results (see Section 3.4.1 from RDWP).

I'd like to ask Ramboll-Environ if they made any adjustments to their SVE well construction based on PDI field observations and if not, if they'd consider adjusting intermediate SVE well, SVE-1B, from a depth interval of 60-70 ft to 70-80 ft to better reflect the depth interval with the highest concentrations. Given the relatively rapid change in mass distribution starting at ~70 ft bgs (see attached), I suspect there is a corresponding change in permeability that the SVE test should take into account when assessing flow and influence. I realize they their VMPs have been completed (monitoring interval at 65 ft bgs); however I'd like to hear their thoughts on final construction intervals for SVE-1B. For example, perhaps their soil logging did not detect a change in permeability. Ramboll-Environ is currently installing SVE-1C and plans to install SVE-1B during this 9-day work week, so any changes would need to be approved quickly.

Please let me know if you'd like to discuss. Also, I'm copying Kim because your VM indicated you'd be out through July 18<sup>th</sup> (apologize if I misheard).

Thanks,

Erin

**RDWP Excerpts:**

Section 3.4.1, "To facilitate SVE pilot testing of various depth intervals over the unsaturated soil profile, pilot test well SVE-1A will be completed at 30 feet bgs (i.e., feet below the finished floor elevation inside the Alb a building), SVE-1B will be completed at a depth of 70 feet bgs, and SVE-1C will be completed at the top of the competent bedrock. The total depth of the wells may be slightly revised in the field based on observations by the field geologist and/or the PDI soil sampling results."

**SVE evaluation criteria from Section 3.0, RDWP:**

The criteria to be used to determine whether SVE will be applied to a given depth or volume where

TCE is greater than the RG of 1 mg/kg is provided below. These criteria will be evaluated using the data collected from the PDI soil boring program and the SVE pilot test as described in Section 3 of the RDWP and Section 4 of the Pilot Test Work Plan contained in Appendix D of the revised Draft RDWP, respectively. The text in Section 3 of the revised Draft RDWP and Section 7 of the Pilot Test Work Plan have been revised to include the below criteria for determining whether SVE alone will meet the OU3 RG.

- For SVE to be effective in the transmission of air through the subsurface unsaturated soil an intrinsic permeability of at least  $10^{-13}$  square centimeters ( $\text{cm}^2$ ) or greater is recommended. The intrinsic permeability is a measure of the ease with which a porous medium can transmit air, water, or other fluids; The corresponding calculated air permeability of the unsaturated soil shall be greater than  $10^{-10} \text{ cm}^2$  for the soil to be amenable to SVE as provided in the *Engineer Manual on Soil Vapor Extraction and Bioventing* (USACE, 2002). Air permeability is the ability of vapors to flow through the soil and is the most important parameter with respect to the design and success of SVE systems in meeting the RG;
- Evidence of soil gas composition ( $\text{CO}_2$ ,  $\text{O}_2$ ,  $\text{CH}_4$ , and VOC) changes within the vadose zone to confirm pore volume exchange during SVE testing. A statistically significant change or trend in soil gas composition during the test will be considered evidence of vapor flow; and
- Achieve a minimum pore-gas velocity between 0.01 and 0.001 cm/s (or ~ 3 to 30 ft/day) everywhere within the contaminated zone where  $\text{TCE} > 1 \text{ mg/kg}$  without requiring unacceptably close SVE well spacing per the following guidance documents: *Engineer Manual on Soil Vapor Extraction and Bioventing* (USACE, 2002) and *Development of Recommendations and Methods to Support Assessment of Soil Venting Performance and Closure* (USEPA, 2001).

If the above criteria are not met resulting in the conclusion that SVE alone will not meet the RG, then in-situ thermal remediation (ISTR) will be implemented.

Erin Hauber, P.E.

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